BALTIC ICEBREAKING MANAGEMENT

Baltic Sea Icebreaking Report 2020-2021

Table of contents

1. Introduction

BIM (Baltic Icebreaking Management) is an organization that includes representatives of all Baltic Sea states. There are Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden.

BIM operates all year round, and its strategy is to develop safe, reliable and efficient winter navigation between the Baltic Sea countries. BIM's overall goal is to ensure a well-functioning maritime transport system in the Baltic Sea all year round by strengthening strategic and operational cooperation between the Baltic Sea countries in the field of winter navigation assistance.

One of the important tasks of BIM is to inform stakeholders in the marine sector and politicians about winter navigation and icebreaker construction.

This report provides an overview of the 2020/2021 winter navigation season for the Baltic Sea region. National reports of the previous years can be found at www.baltice.org

St. Petersburg
Petr Parinov
Chairman of the BIM

2. Overview of the icebreaking season (2020-2021) and its effect on the maritime transport system in the Baltic Sea region

According to the Finnish Ice Service of the Finnish Meteorological Institute the Baltic Sea ice season 2020-2021 was average. The maximum ice extent, 127 000 km², was reached on 15 of February.

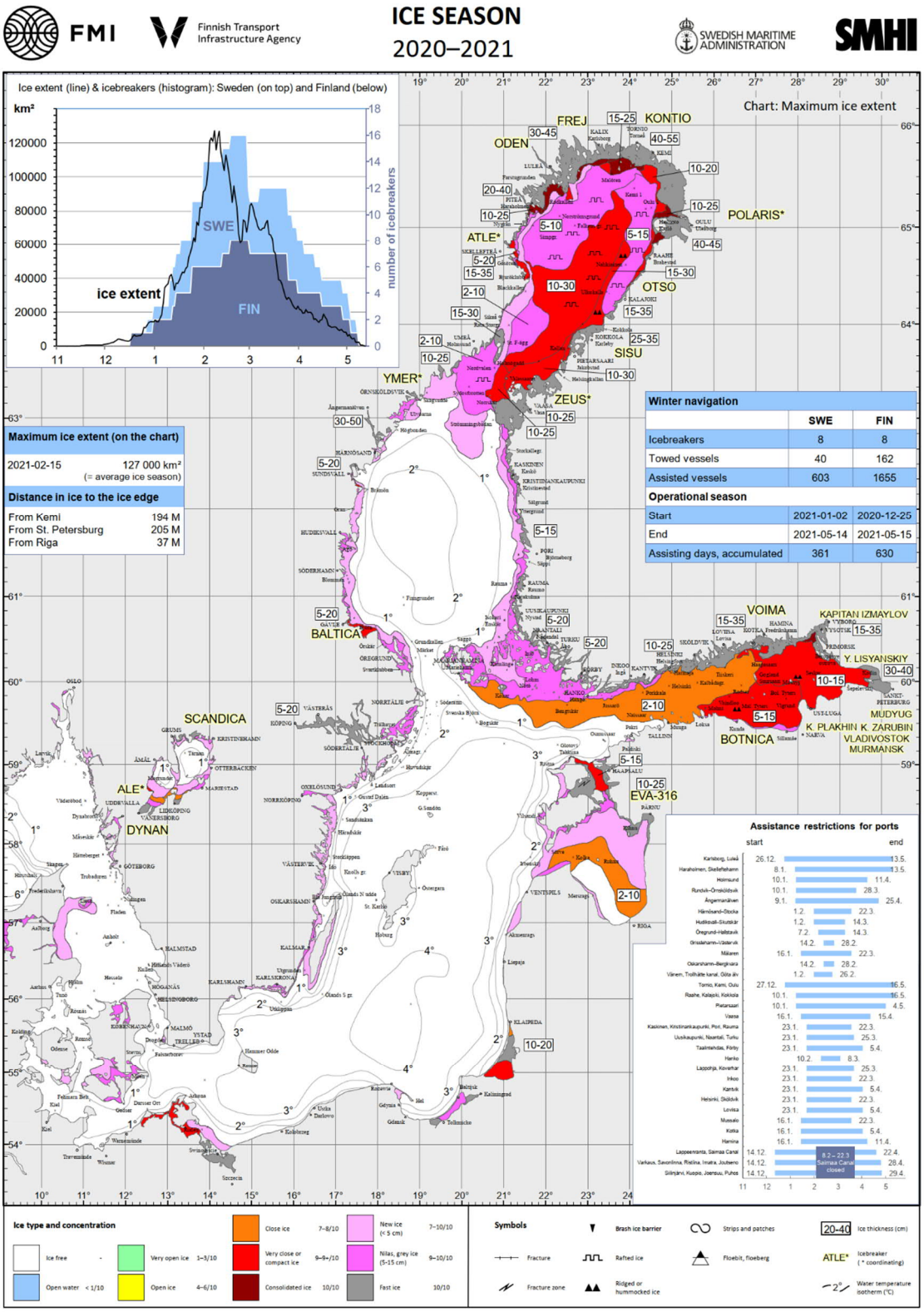


Figure 1. The maximum ice extent of the ice season 2020-2021 was reached on 15 of February.

The freezing started from inner bays of the Gulf of Bothnia in the second week of November. However, November was milder than normal and the end of November there is hardly any ice. The ice extent was below 1000 km². December was also mild and at the end of December, the extent of sea ice was only 6 000 km². First icebreakers were started their assistance work around Christmas.

In January, the prevailing wind direction was between north and southeast, and the temperatures were wintery. The coldest period in January was the middle of the month and ice quickly formed along the entire length of the Finnish coast. After less than a week of severe frosts, the frost eased a bit and there was mildness, especially in the southern sea areas. In the Bay of Bothnia, the amount of ice increased steadily, but in other sea areas at the end of the month the amount of ice did not increase much. Beginning of February, the extent of ice was a bit over 7 000 km².

In February, cold air flowed from the north to Finland and the icy area expanded. In the second week of the month, ice had formed up to the center line of the Gulf of Finland, and there was also new ice in the Archipelago Sea in the outer archipelago. The Quark was covered with drift ice at the beginning of the month. The Saimaa canal was closed on 8 February. The ice area was at its largest on February 15, when there were 127,000 km² of ice. At that time, the Bay of Bothnia was completely ice covered and there was also ice on the German coast and in the Danish straits.

At the end of February, milder air flowed to Finland from the south-west. In Åland, the temperature rose to +10 degrees Celsius, and the temperature was above zero also in the Bay of Bothnia.

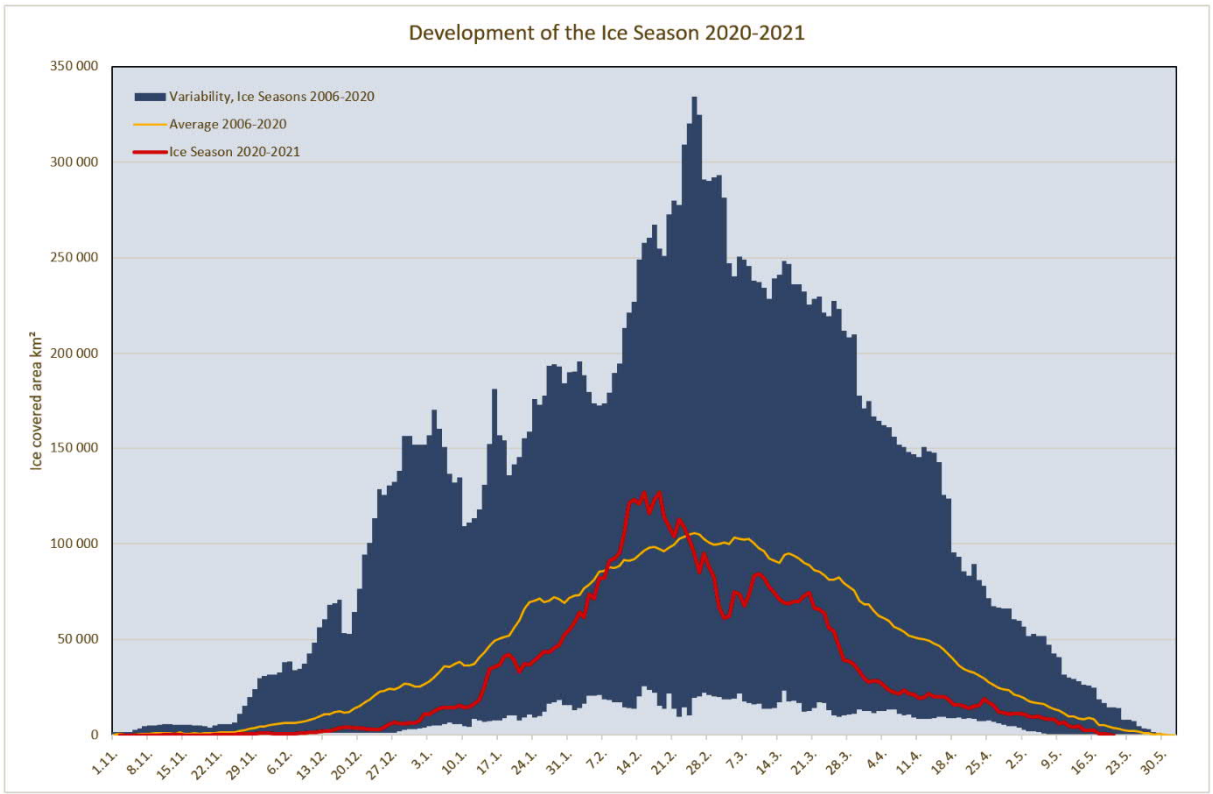


Figure 2. The development of ice season 2020-2021 compared to seasons 2006-2020.

The end of February was warm and by the end of the month the ice had shrunk to 88,000 km². During the first half of March the weather was cold at times, but the rest of the month was mild. The ice extent in the end of March was 30 000 km².
April was warmer than usual. Sea of Bothnia was ice free before the middle of month and the Gulf of Finland was ice free before the end of April. In the end of month, extent of ice was 11 000 km².
Last ice melted from Bay of Bothnia 20th of May.

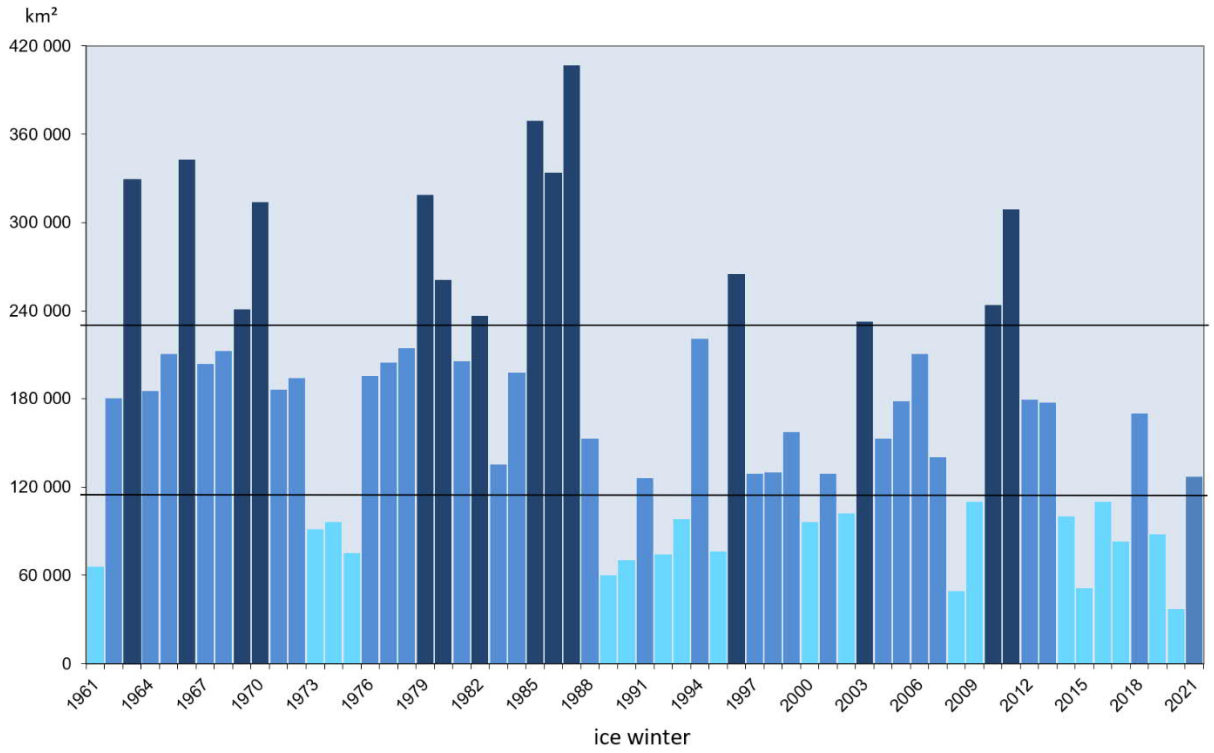


Figure 3. The maximum ice coverage in ice winters 1961-2021. The average of 1961-2011 (51 years) is 187 000 km². Severities of the season are indicated using colors from mild to severe (lightest blue to darkest blue respectively).

Ice conditions in the eastern part of the Gulf of Finland in 2020-2021:

In general, the ice situation in the eastern part of the Gulf of Finland was developing according to the type of middle winter. Ice formation in the coastal shallow zone of the eastern part of the Gulf of Finland began in the second decade of December. At the same time, the appearance of nilas ice was observed in the Neva Bay and in the northern part of the Vyborg Bay.

The weather in the first decade of January in the Gulf of Finland was moderately cold. The temperature reached minus 20 degrees at night and minus 15 degrees during the day. The temperature background contributed to the rapid increase of the ice cover.

By the end of January, the ice situation became more complicated. The water surface of the Neva Bay and the Vyborg Bay was covered with very cohesive ice 10 to 25 cm thick. Fast ice 20-30 cm thick was formed along the coast of the Neva Bay and in the northern part of the Vyborg Bay. Very cohesive ice 15-20 cm thick extended to the island of Gogland. Fast ice 30-40 cm thick was noted in the water area of the Neva Bay, Vyborg Bay and the port of Primorsk.

February was a cold month. Average monthly temperatures were minus 10-17 degrees. In the first and second decades of February, winds of the north-eastern and the eastern directions prevailed, therefore, the most difficult ice conditions developed on the approaches to the Vyborg Bay. The approaches to the seaports of Primorsk and Ust-Luga were also complicated due to very close ice. At the end of February, the ice situation on the approaches to the seaport of Big Port of St. Petersburg was complicated by the action of the north-western winds. The edge of very cohesive ice was in the area of the buoy 1 of the Great Ship's Fairway. Cohesive ice 5-15 cm thick spread to the meridian of the port of Tallinn.

Due to the action of the northern winds, a strong compression and hummocking of ice was observed in the area of the buoy 4 and between buoys 6 and 10 of the Great Ship's Fairway. The ships followed under icebreaker assistance. Very cohesive ice 20-35 cm thick was observed in the water area of the port of Ust-Luga.

In March, the air temperatures were close to the average long-term values. No intensive ice formation was observed. However, under the influence of winds of various directions, the ice cover drifted and greatly

hampered navigation. In the second half of the month, the process of ice melting began. Ice conditions in the port of Primorsk, port of Ust-Luga and on the approaches to the Vyborg Bay improved.
In April, the destruction of the ice cover began to occur more intensively. By April 7, the water area of the Neva Bay cleared of ice. Vessels going to such seaports as the port of Big Port of St. Petersburg, the port of Primorsk and the port of Ust-Luga began to call without icebreaker assistance. On April 20-21, the period of icebreaker assistance was completed in all Russian ports of the Baltic Sea.

The maximum thickness of fast ice was 40-70 cm in the Bay of Bothnia, 20-45 cm in the Sea of Bothnia and 20-50 cm in the Gulf of Finland. The thickness of pelagic ice was 10-50 cm in the Bay of Bothnia, 5-20 cm in the Sea of Bothnia and 15-35 cm in the Gulf of Finland.

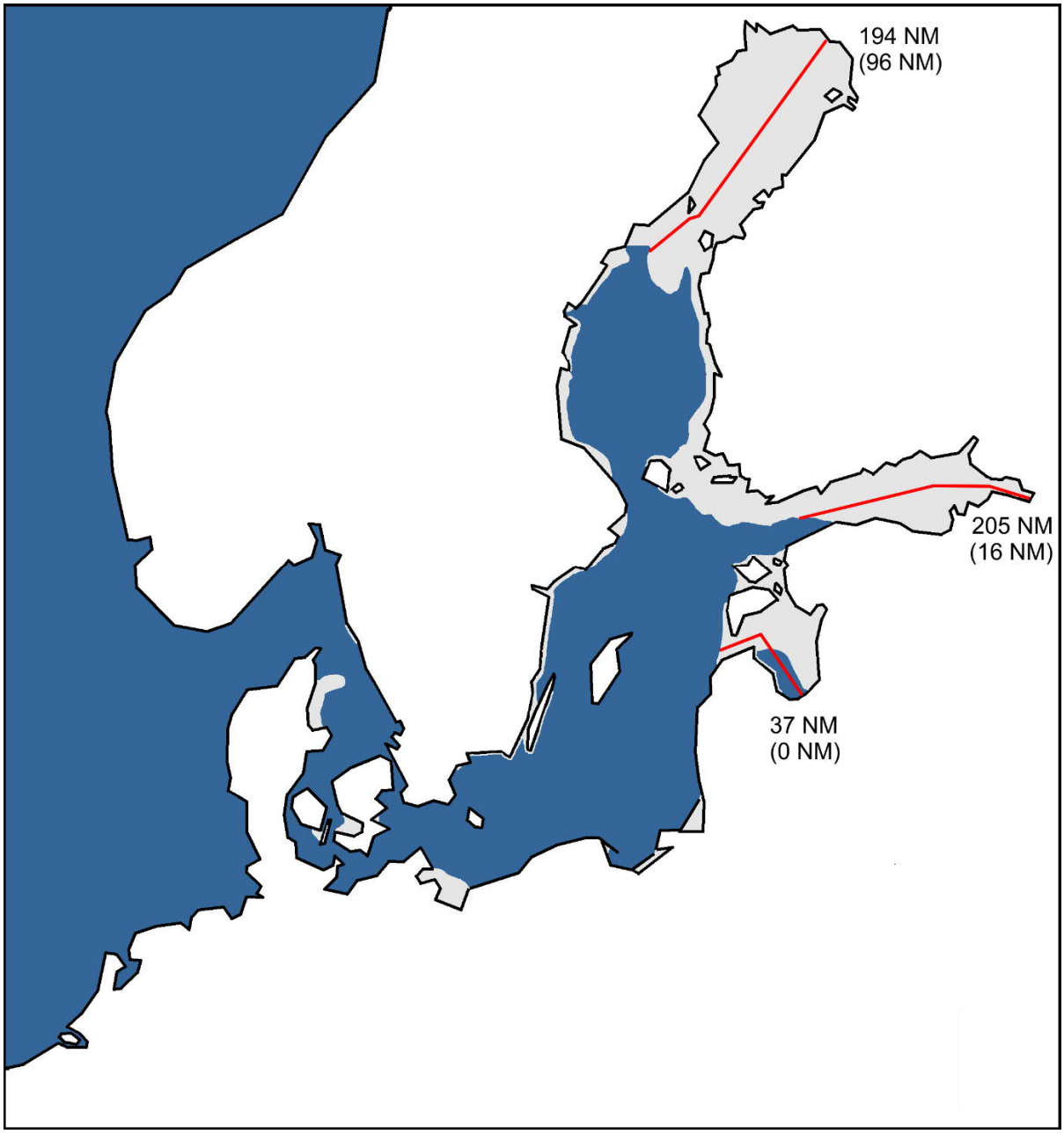


Figure 7. Sailing distance from ice edge during maximum ice extension on 15th of February 2021: to Kemi 194 nautical miles, to St. Petersburg 205 nautical miles and to Riga 37 nautical miles (in parentheses distance on ice more than 15 cm thick).

3. Accidents and incidents in sea ice

Whenever a maritime accident or incident occurs in Finnish waters a report (also called a maritime safety report) must be filed to the Finnish Transport and Communications Agency (Traficom). The report should contain a detailed account of the accident/incident and any details that could be of help in determining its causes. More information can be found on (https://www.traficom.fi/en/asioi-kanssamme/ilmoitus-aluksen-onnettomuudesta-ja-vaaratilanteesta).

REPORT TO TRAFICOM'S DUTY OFFICER

In addition, all maritime accidents should always be reported to Traficom's inspector on duty.
Contact information:
phone +358 203 28010, in case of accidents in the Gulf of Finland or on inland waterways
phone +358 203 28020, in case of accidents in the Archipelago Sea or the Gulf of Bothnia.

4. Winter Navigation Research

Winter navigation research is carried out in co-operation between Finland and Sweden. Funds for research projects are allocated by the Winter Navigation Research Board, which consists of representatives of the Finnish Transport Infrastructure Agency, Finnish Transport and Communications Agency, Swedish Transport Agency and Swedish Maritime Administration. Published research reports can be found on www.traficom.fi (https://www.traficom.fi/fi/ajankohtaista/julkaisut/talvimerenkulun-tutkimusraportit).

5. Costs of Icebreaking services in the Baltic Sea

5.1 Finland

In Finland the costs of icebreakers stand-by and operational costs were around 50 million euro, and bunkers were 6 million EUR for the winter 2020-2021. The costs of the Finnish icebreaking services vary normally from 40 to 60 million euro depending on winter.

5.2 Sweden

In Sweden the cost for the stand-by period for our own icebreakers is approximately 12 million euro, additional operational costs are 8 million euro, and fuel costs 2,5 million euro due to the mild winter. The total cost for the Swedish icebreaking services including external recourses varies from 20 to 40 million euro, depending on the severity of the winters. This is the government's costs; costs for the different ports and industries are not included.

5.3 Russia

In accordance with the orders of the FTS of Russia dated 20 December 2007 No. 522-t/1 and 18 November 2014 No. 262-t/5, and by order FAS of Russia of 06 June 2016 No. 711/16, new rates of icebreaking dues in the Russian ports of the Gulf of Finland are established as follows:

Icebreaking dues:
1. Icebreaking dues are applied for coming in, coming out or transiting the port area.
2. For the cargo ships engaged in liner services, which are officially declared, the factor of 0.8 is applied to the rates of the icebreaking dues.

From icebreaking dues are exempted:
- vessels of ice class ARC7 (according to classification of the Russian Maritime Register of Shipping or classes of other classification societies corresponding to it);
- passenger vessels.

Upon the announcement by the Harbour Master of winter (summer) navigation before the target date, and also after the prolongation of its duration, icebreaking dues are paid as per corresponding rates from the date of announcement to a date of completion (inclusive), corresponding to the period of winter navigation.

Rates for ships engaged in an international trade rub/1 GT (for Bolshoy port of Saint-Petersburg)

	All vessels except Ro-Ro, Ro-Flow, container ships and tankers	Container ships	Ro-Ro, Ro-Flow	Tankers
The summer rate from 01 May to 30 November	6.65	4.64	2.67	7.28
The winter rate from 01 December to 30 April	16.55	11.58	6.36	18.14

During the period from 01 May to 30 November, the following vessels are exempted from payment of icebreaking dues:

- arriving at the port from inland waterways of Russia or from the Saimaa canal and sailing back within the current year;
- arriving at the port from other Russian ports situated in the eastern part of the Gulf of Finland.

During the period from 01 December to 30 April, the vessels with ice class ARC5 and ARC6 (according to classification of the Russian Maritime Register of Shipping or classes of other classification societies corresponding to it) are subject to icebreaking dues multiplied by factor 0.75.

5.4. Estonia

In Estonia, the total cost of icebreaking in the 2020-2021 season amounted to approximately 6,8 million EUR, with about 600 000 EUR accounting for the costs in the Pärnu Bay and 6,2 million EUR for the Gulf of Finland. This is the Governmental costs.

5.5 Latvia, Lithuania, Poland and Germany

There was no cost information for icebreaking operations in the season 2020-2021 for Latvia, Lithuania, Poland and Germany.

5.6 Denmark

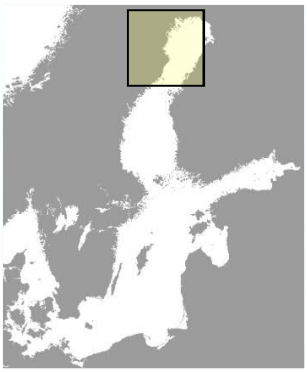
There was need for icebreaking assistance in Danish waters during the winter 2020-2021. Eight days with assistance from icebreaking tug in the Limfjord.
The operational costs of icebreaker services were around 438 000 euro for the 2020-2021 winter period.

5.7 Norway

During the winter 2020/21, the total costs of ice breaking service in Norwegian waters were approximately EUR 1.3 million (Ex.Wat).

6. Winter navigation in the different parts of the Baltic Sea

6.1 Bay of Bothnia



Winter 2020-2021 was average but exceptional again in Finnish waters. The ice coverage was 127 000 km². Especially the start of the winter season wasn't normal, because of abnormally high seawater temperatures due to the early and not so strong autumn storms.
The need for icebreaking assistance started on 29.12.2020 when first vessel was asissted by IB Kontio and the last assistance was on 8.5.2021 by IB Polaris.

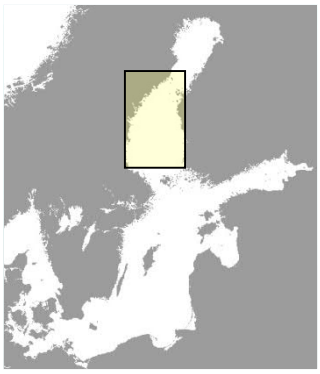
The biggest difference compared to the earlier years was that the ice in the center part took quite a long time to freeze over causing the ice to be thinner than usually. The maximum ice extent was reached in mid February.

Strong Northly winds in April caused the ice field to move South where the thin ice had already melted.

First restriction starting on:	27.12.2020
Last restriction ending on:	16.05.2021
Restriction days:	141
First assistance started:	29.12.2020 06:40
Last assistance ended:	08.05.2021 18:15
Port call events with assistances:	1095

6.2 Sea of Bothnia and the Quark

During this season ice was found only in the Quark area. The ice extent hardly reached to the fairway areas on the Finnish side at the Sea of Bothnia.



Sea area of port (Finland):	Sea of Bothnia	Quarken
First restriction starting on:	23.01.2021	16.01.2021
Last restriction ending on:	25.03.2021	15.04.2021
Restriction days:	62	90
First assistance started:	02.02.2021 07:48	01.02.2021 18:39
Last assistance ended:	20.03.2021 18:15	30.03.2021 19:34
Port call events with assistances:	0	18

Restrictions were issued to all Swedish ports in Sea of Bothnia.

6.3 Gulf of Finland

The ice formation in the Gulf of Finland started building up very slowly this season. The first Finnish icebreaker in the area was IB Voima, which started its season 22nd of January when low temperatures were forecasted but the weather remained quite mild. Then in the mid-February there was a rapid change in the weather conditions and the ice formation was fast. Icebreakers Urho and Fennica were ordered to the area. As soon as these icebreakers arrived to the area the temperatures started immediately getting warmer and the need for icebreaking services was again smaller and icebreaker Urho was relocated to the Bay of Bothnia and Fennica was sent back to standy-by. Icebreaker Voima continued operating in the area until 1st of April.

First restriction starting on: 16.01.2021
Last restriction ending on: 11.04.2021
Restriction days: 86
First assistance started: 26.01.2021 18:50
Last assistance ended: 31.03.2021 09:50
Port call events with assistances: 125

In the seaports of Russia in the eastern part of the Gulf of Finland and on the approaches to them during the winter navigation period 2020/2021, in accordance with the orders of the Harbour Master of the seaport, the following ice restrictions were announced:

Seaports of the Baltic Sea	period of ice restrictions Start – Completion	icebreakers assistance Start – Completion	Vessels under assistance
St. Petersburg	13.02.2021– 01.04.2021	16.12.2020–21.04.2021	3909
Primorsk	28.01.2021– 12.04.2021	16.01.2021–21.04.2021	252
Vyborg	13.02.2021– 06.04.2021	16.12.2020–20.04.2021	49
Vysotsk	13.02.2021– 06.04.2021	11.01.2021– 20.04.2021	243
Ust-Luga	13.02.2021– 01.04.2021	01.02.2021– 21.04.2021	551

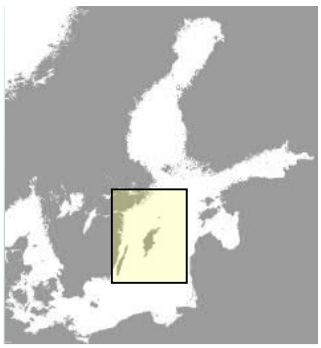
For the Estonian part of the Gulf of Finland traffic restrictions were imposed from 18.02.2021. Restrictions were cancelled from 22.03.2021. IB Botnica assisted 27 ships to and from Estonian ports in the Gulf of Finland.

6.4. Gulf of Riga

Estonia: The Estonian Meteorological and Hydrological Institute assessed the winter of 2020/2021 as mild. The traffic restrictions were initiated 27 th of January being IC-1600 kW in Pärnu. From 22th March traffic restrictions were cancelled. The icebreaking season lasted from 09 th of February to 06th of April and 67 ships were assisted by icebreaker multi-purpose-vessel EVA 316. Assistance has been conducted to following ports: Pärnu

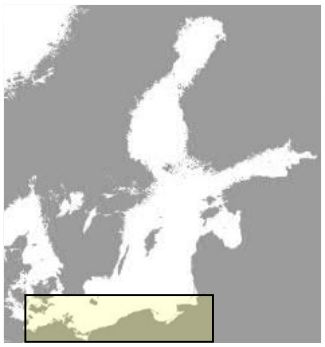
Latvia: Due to the mild 2020-2021 winter season and very favorable winds during the coldest time of the season no serious ice formation was experienced in the Gulf of Riga Western part and Irbe strait.

6.5 Central Baltic



No restrictions were issued to Swedish ports.

6.6 Southern Baltic



East Coast Area. Ports of Gdańsk and Gdynia
Last winter was colder than usual especially from last decade of January to the last decade of February. Ice formation appear in all ports, however there were no significant difficulties for shipping caused by ice. The ice on inner waters of the ports was easy to break by usual ships traffic.
There was no need to engage icebreaking tugs on the approaches to the ports.
West Coast Area. Ports of Szczecin and Świnoujście
Regarding to temperatures the winter months November and December 2020 were mild, with mean temperature plus 10 and plus 6.
January 2021 was a little colder, but temperature did not drop below zero.
February 2021, the first half, was definitely cold, with some days with constant minus temperatures, up to minus 10. The next days were warmer and March was warm as well

The first ice formation appeared on 06 of February 2021. In the beginning there was no obstacle to navigation. The navigation in the area was more difficult a little later when ice became more thick, about 10 cm, and due to the winds the ice has been a little ridged and heaped up and it was some obstacle to navigation. In the second half of February it started to be warmer and the ice started to melt very quickly. On 28 of February 2021 ice disappeared and water was free of ice in the area.

The first restriction was put into force on 06 February 2021 and it was said that the main fairway Swinoujście - Szczecin and port of Swinoujście and Szczecin were not available for wooden and laminate small vessels. This restriction was suspended on 28 of February 2021.

08 of February 2021– 28 of February 2021 the main fairway Świnoujście - Szczecin and port of Szczecin was available for vessels with ice class L-4 PRS (or equivalent class of other Classification Society) and main engine with power above 1200 KW.

09 of February 2021 – 26 of February 2021 – one-way traffic was established on the water fairway between Gate No I and Gate No IV.

It was one ice breaking action on 12 of February 2021. The ice breaker was working 8 hours within the area of the fairway between the Gate No 1 and the Gate No 4.

6.7 Danish waters, Swedish West coast, Germany and Norwegian waters

Denmark: At the beginning of the winter the sea surface temperature was about 2 degrees above the normal (mean temperature in a 35 year's period). The temperature was general 2 degrees higher than the normal until the beginning of February when it dropped to about 2 degrees below the normal. The surface temperature has risen again and in the end of February it was about 2 degrees higher than the normal. There was need for icebreaking assistance in the Western part of Limfjorden. Icebreaking capacity was active in 8 days.

Germany: This winter was a warm winter, water temperature was not under 2°C. So we didn't have any ice on the whole German coast.

Norway: The 2020-2021 was a relative hard ice winter in Norwegian Waters. Norwegian Ice Services is a part of the Norwegian Coastal Administration and conducted ice breaking in to 10 ports along the Norwegian coastline. To perform the ice breaking, 10 harbour tugs and 1 ice going ferry was used. Neither Norwegian Coast Guard, nor Norwegian Coastal Administration has conducted any ice breaking service using their own vessels. No traffic restrictions had to be imposed during the winter season.

7. Description of organizations and icebreakers engaged during the season 2020-2021

7.1 Finland

The Finnish Transport Infrastructure Agency (FTIA) is the national authority responsible for the assistance of winter navigation, its coordination, development and management nation-wide. The actual icebreaking services are procured.

The FTIA develops Finland's icebreaking, taking into account the requirements of its clients (mainly the Finnish industry) and end users. Essential for the industry are as short waiting times as possible for the traffic. The FTIA makes decisions concerning the length of the assistance period, exemptions and assistance restrictions.

The assistance restrictions follow minimum HELCOM safety recommendations, to assure an efficient and safe maritime traffic flow. Only vessels fulfilling the requirements of the ice class given in the assistance restrictions at each time are granted assistance.

The icebreaking services are procured and the FTIA has entered into agreements with Arctia Icebreaking Ltd and Alfons Håkans AS and with some private companies for minor operations (mainly tugboat services for ice breaking in light ice-conditions in harbour entrances and in the Lake Saimaa).

FTIAs' Maritime Transport Unit is responsible for coordinating the icebreaking services in Finland. Coordinator masters on icebreakres are locally responsible for the arrangement and daily operation of icebreaking, in close cooperation with Fintraffic´s Vessel Traffic Service and Finnpilot Pilotage Ltd, to all winter ports.

The main goal is that vessels should not have to wait for an icebreaker for more than 4 hours on an average. Another goal for the Finnish icebreaker service standard is that 90 % of vessels navigating in the ice field will get through without waiting for icebreaker assistance.

The average icebreaker waiting time for all Finnish sea areas during last season was 2,6 hrs. and 97% of all port calls did not have to wait for icebreaker assistance at all.

In Finland no special fee is collected for the icebreaker service, but all ships pay fairway dues based on ship size and ice class.

A state agreement between Sweden and Finland further develops a long co-operation in winter navigation activities, decades long, between the countries. Optimal usage of "shared" IB resources lower the total costs and grant more reliable services to customers.

Icebreakers engaged by the Finnish Transport Infrastructure Agency 2020 - 2021:

Name	Type	Propulsion power	Season of the icebreakers
Kontio	Icebreaker	15 000 kW	25.12.2020 - 05.05.2021
Otso	Icebreaker	15 000 kW	08.01.2021 - 10.05.2021
Polaris	Icebreaker	19 000 kW	20.01.2021 - 15.05.2021
Voima	Icebreaker	10 200 kW	22.01.2021 - 01.04.2021
Sisu	Icebreaker	16 200 kW	01.02.2021 - 07.04.2021
Urho	Icebreaker	16 200 kW	20.02.2021 - 22.04.2021
Fennica	Icebreaker	15 000 kW	25.02.2021 - 08.03.2021
Zeus of Finland	Icebreaking AHT	5 420 kW	01.02.2021 - 01.04.2021

Icebreaking Tugs engaged for Lake Saimaa icebreaking by FTIA 2020-2021:

Tug Calypso/Saimaa	1400 + 1200 kW	07.12.2020 - 05.02.2021 and 20.03.2021 - 29.04.2021
Tug Protector	2710 kW	03.01.2021 - 04.02.2021 and 21.03.2021 - 17.04.2021
Tug Meteor	1300 kW	13.12.2020 - 04.02.2021 and 21.03.2021 - 01.05.2021

The total number of assisted vessels to and from Finnish ports during season 2020-2021 were approximately 4 500.

The FTIA has taken delivery of a totally new icebreaking concept to the Lake Saimaa and Saimaa Canal. A detachable self-propelled icebreaking bow Saimaa. Icebreaking bow Saimaa is connected to the Alfons Håkans owned pusher (tug) Calypso during the winter season. Saimaa is laid up during the summer time in the Mustola harbor in Lappeenranta and Calypso is engaged to her normal harbor assistance duties.

Operating experiences after the first winter were only positive. Saimaa together with Calypso brings more efficient icebreaking and ice management operations to the Lake Saimaa and Saimaa Canal.

Full-scale ice trials were carried out at Lake Saimaa in late March last winter. The icebreaking bow performed well during the ice trials and fulfils its icebreaking performance requirements. Ice trials were performed by Aker Arctic Technology Inc. Saimaa together with Calypso managed ~4.7 kn ahead at 60 cm level ice and ~2.9 kn at 70 cm level ice.

7.2 Sweden

The icebreaking operations are managed by the Icebreaking Management of the Swedish Maritime Administration in Norrköping and are based on the Swedish icebreaking regulation (2000:1149).
The Icebreaker Management allocates icebreakers to work areas, issues traffic restrictions, monitors the operational situation and informs the shipping stakeholders of ice conditions and the traffic situation. Sweden controls six icebreakers, of which the Swedish Maritime Administration owns five and has one on long-term charter from a private ship owner. All Swedish icebreakers are manned by a private shipping management company.

Sweden and Finland use a jointly developed IT based on-line system, IBNet (Icebreaker Net) for coordination of the joint icebreaking operations.
IBNet contains information about the weather, ice conditions and traffic situation, and transmits the information between the different connected units (icebreakers, coordination centres, VTS etc.).
In addition to the icebreakers, ice strengthened buoy tenders of the Swedish Maritime Administration and private tugboats are also engaged in the icebreaking service.
Helicopters are chartered and used for ice reconnaissance and personnel transport in order to reduce time expenditure for icebreakers. Cooperation with the tugboats in ports is common around the coastline.
The governmental funding and fairway dues cover the costs for the icebreaking operations and no vessel that receives assistance from icebreaker is charged.
Icebreakers engaged by the Swedish icebreaking service in 2020/2021:

Name	Type	Engine power
ALE	Icebreaker	3500 kW
ATLE	Icebreaker	18400 kW
FREJ	Icebreaker	18400 kW
ODEN	Polaricebreaker	18000 kW
YMER	Icebreaker	18400 kW

Total number of used icebreakers in operation per week - Sweden

Week	Sea Icebreakers (more than 7500 hp)	Other Icebreakers	Total Icebreakers
w.1	1		1
w.2	1		1
w.3	2		3
w.4	4		4
w.5	5		5
w.6	4	1	5
w.7	4	1	5
w.8	4	1	5
w.9	4	1	5
w.10	4		4
w.11	5		5
w.12	5		5
w.13	4		4
w.14	3		3
w.15	2		2
w.16	2		2
w.17	2		2
w.18	2		2
w.19	1		1
w.20	1		1

Assisted vessels - Sweden
Number of vessels assisted to and from Swedish ports season 2020-2021: 354

7.3 Russia

The Harbour Master of the seaport has the power to impose ice restrictions in the port and on approach channels, based on actual ice conditions (according to articles Nos. 74 & 76, Russian Federal Law No. 81-FZ, Russian Merchant Marine Code, 30 April 1999).
The ice navigation assistance is conducted by the state-owned icebreakers and covers the seaports: Bolshoy port of St. Petersburg, Primorsk, Vyborg, Vysotsk and Ust-Luga. The state-owned icebreakers assists the inland transit navigation via the Saimaa Canal both ways.

The icebreaker fleet consists of the following icebreakers:

Name of icebreaker	Engine power	Period of work
CAPITAN M. IZMAILOV	4 000 KW	16.12.2020 – 20.04.2021
IVAN KRUZENSTERN	4 500 KW	16.12.2020 – 09.04.2021
CAPTAIN ZARUBIN	3 300 KW	28.12.2020 – 19.04.2021
MUDYUG	7 000 KW	19.01.2021 – 16.04.2021
YURI LISYANSKY	4 000 KW	16.01.2021 – 04.03.2021
CAPITAN PLAKHIN	3 240 KW	15.01.2021 – 01.04.2021
MURMANSK	17 400 KW	10.02.2021 – 31.03.2021
VLADIVOSTOK	17 400 KW	05.02.2021 – 18.03.2021
CAPTAIN SOROKIN	18 300 KW	12.02.2021 – 24.03.2021
VIKTOR CHERNOMYRDIN	25 000 KW	28.01.2021 – 20.03.2021
CAPTAIN NIKOLAEV	18 000 kW	15.02.2021 – 01.04.2021
SEMION DEZHNEV	4 500 KW	In operational reserve

The icebreaker assistance, as a rule, is conducted as follows:

1. Independent ice navigation following icebreaker recommendations and strictly under him supervision.
2. Icebreaker assistance in a convoy.
3. Individual icebreaker assistance behind an icebreaker.

Icebreaker assistance is provided to ships that are not subject to the current restrictions in the ports of destination. Icebreaker assistance to ships coming from the sea is provided from the convoy formation point to the inner road of the port, and ships leaving the port are provided with assistance from the inner road of the port to the area near the convoy formation point (CFP)

All ships coming from the sea are prohibited from entering into the ice toward the east of the convoy formation point (PTP) without the permission of the icebreaker.

The Masters of ships following independently with the permission of the icebreaker, when passing the checkpoints of the recommended route, must inform the icebreaker about the ice situation in the area. If such a ship gets stuck in the ice, icebreakers must help she and correct the recommended route or include the vessel in the convoy for further movement. The Masters of the ships are advised not to rely on information received from other ships and not confirmed by the icebreaker captain.

Depending on the thickness of the ice on the approaches to the Russian ports in the eastern part of the Gulf of Finland, the Harbor Master sets restrictions for vessels in accordance with their ice class.

7.4 Estonia

The responsible organization for icebreaking in Estonia is the Estonian Transport Administration. The Director-General of the Estonian Transport Administration decides on traffic restrictions and directives on winter navigation.

Ports that are serviced by state ice-breakers are Muuga Harbour, harbours of Tallinn and Kopli Bay, Paldiski North Harbour, Paldiski South Harbour, Kunda Harbour, Sillamäe Harbour and Pärnu Harbour.

Estonia has two icebreakers, TARMO and BOTNICA, to operate in the Gulf of Finland area, and the multi-purpose vessel EVA-316 to operate in the Pärnu Bay. None of these vessels were used for icebreaking purposes last winter.

Icebreakers engaged by the Estonian icebreaking service in 2020/2021:

Name	Type	Engine power
EVA-316	Icebreaker	5151 kW
BOTNICA	Icebreaker	15084 kW

Total number of used icebreakers in operation per week – Estonia:

Week	Sea Icebreakers (more than 7500 hp)	Other Icebreakers	Total Icebreakers
w.1		1	1
w.2		1	1
w.3		1	1
w.4		1	1
w.5		1	1
w.6	1	1	2
w.7	1	1	2
w.8	1	1	2
w.9	1	1	2
w.10	1	1	2
w.11	1	1	2
w.12	1	1	2
w.13		1	1
w.14		1	1

7.5 Latvia

There is one icebreaker – the i/b "Varma" (10 000 kW), which is owned and operated by the Freeport of Riga Fleet, Ltd. Ice breaker was on stand by but no traffic restrictions were issued for port of Riga. Some icebreaking by port tugs was carried out in port area only. Therefore no additional icbreaking costs involved. No restrictions were issued for Latvian ports in Gulf of Riga except for port of Skulte were traffic restrictions were in place from 11.02 - 02.03.2021.

7.6 Lithuania

The port of Klaipeda is the northernmost ice free port in the eastern Baltic coast. Klaipeda State Seaport Authority is the responsible organisation for icebreaking in Klaipeda harbour areas. The Lithuanian fairways are open all year round.

7.7 Poland

Eastern & Western part:
Since last autumn Gdynia Maritime Office can use for icebreaking action new multipurpose vessel "Zodiak II" which will be used for protecting approach to the ports Gdansk, Gdynia and Hel.

7.8 Germany

The Federal Waterways and Shipping Authority, Northern Region Office in Kiel coordinates according to an overall plan the icebreaking service for the harbour entrances, coastal and sea regions in German parts of the Baltic Sea.
The German ice service plan is set up annually by the responsible authority, listing all available vessels which are capable of icebreaking, giving information on the respective areas of icebreaking service, the expected ice situation etc.

Vessels available for icebreaking operations:

Name	Type	Engine power
NEUWERK	Multi-Purpose vessels	8400 kW
MELLUM	Multi-Purpose vessels	6620 kW
ARKONA	Multi-Purpose vessels	3700 kW

In addition to that, a number of smaller tugboats and river icebreakers are available for the inner coastal waters and harbours.

7.9 Denmark

Rules and regulations for icebreaking in Danish waters is described in "Act on the amendment of the National Ice Service Act". Upon consultation with the Ice Service Council the minister of defence lays down the rules for the establishment of the icebreaking service in Danish waters for certain areas, named readiness areas.
The icebreaking service for readiness areas is financed by 25% from the requiring vessel and 75% by the Ice Service. The Ice Service will collect an annual fee from port administrations calculated on the basis of the volume of goods passing through the individual ports. In the new Act a state-controlled icebreaker shall be understood as icebreaking resources chartered by the state and other vessels used for icebreaking by the Ice Service.
When the ice situation so demands, assistance can be requested against payment. On Danish Defence homepage, ship owners with icebreaking capacity have the possibility to lay down information on these capacities and contact information to the company. If in any doubt or help needed, the Maritime Assistance Service can be contacted.
The Ice Service recommends that the necessary precautionary measures be taken in areas where experience shows that ice may make navigation very difficult.
No icebreakers available for icebreaking operations.

7.10 Norway

Norwegian waters, the Norwegian Coastal Administration is responsible of all ice breaking in the main fairways including approaches to ports. From the beginning of 2021 the Norwegian Coastal Administrations Ice Services was re organized to include the whole Norwegian coastline from the Russian border in the north, to the border of Sweden in south eastern part of the country.

Governmental vessel with ice breaking capability:

Name	Type	Engine power
Svalbard	Coast Guard vessel	13 500 kW
Kronprins Haakon	Research vessel	10 000 kW

Private vessel with ice braking capability:

Name	Type	Engine power
Bamsetug	Tug	3564 kW
Stadt Kinn	Tug	3773 KW
FFS Amaranth	Tug	3080 KW
Max Mammut	Harbour Tug	2013 KW
Balder	Harbour Tug	1968 KW
Bauge	Harbour Tug	1824 KW
Kraft Johansen	Harbour Tug	1678 KW
Bebe	Harbour Tug	1435 KW
Tor III	Harbour Tug	1052 kW
Tug Frier	Harbour Tug	883 KW

8. Progress report of BIM (Baltic Sea Icebreaking Management)

One important topic is to find solutions for how the existing Baltic Sea icebreakers can be utilized in other nations' icebreaking service and as previously mentioned, the long term vision of the BIM is a common icebreaker fleet in the Baltic Sea.
The Nordic countries have an agreement for cooperation that was signed in the early sixties.
Between the governments in Finland and Sweden an agreement was signed 2011.
In that agreement the states emphasizes the importance of well-functioning winter navigation for industry and trade.
In the Sea and Bay of Bothnia the two countries icebreaker fleets works as a common fleet, this cooperation can also be extended to other areas as the Gulf of Finland and the Baltic. This may serve as a model for other countries in terms of cooperation within icebreaking.
One other important project was the modernization of the joint website http://www.baltice.org which has been operational since 2007, the modernization was completed before winter season 2015-2016.
Within the Trans-European Transport Network (TEN-T) have a project started called "WINMOS II" Winter navigation Motorways of the Sea. The WINMOS II project is a continuity for WINMOS project, which was completed in spring 2016. WINMOS II aims to develop the maritime navigation system, improve environment performance and secure ice breaking resources in the Baltic.

www.baltice.org